

AN INVESTIGATION OF THE USE OF THE PHYSICAL SCIENCES  
AND ALTERED STATES OF CONSCIOUSNESS  
TO CONSTRUCT A MODEL FOR THE  
FACILITATION OF DIALOGUE  
BETWEEN OBJECTIVE AND  
SUBJECTIVE DISCIPLINES

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THE SCHOOL OF THEOLOGY AT CLAREMONT

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Requirements for the Degree  
Doctor of Ministry

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by  
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## ABSTRACT

This project concerns the need for the construction of a model for the facilitation of dialogue between the subjective and objective disciplines as they relate to human experience.

The method employed is the correlation of data from the physical sciences, particularly brain physiology, with descriptions of altered states of consciousness. The data from physical sciences include a brief survey of the ontogeny of the universe, evolution and the ontogeny, structure and function of the human brain. The sections dealing with the brain include brain levels, brain states, brain hemispheres and relevant brain structures and functions. The data on altered states of consciousness includes a description of the means of their induction, characteristics and special states. Each of these are related to the data from the sections on the physical sciences.

The proposed model is the combination of the physical data and the subjective data. This model is contrasted with the common sense model of experience to demonstrate the basic points of divergence.

To accomplish this goal I have primarily used library research, but behind the work evident in this paper stands twelve years of reading and consideration. My principle method in the construction of the model



has been reflection on my own and other's mystical experiences.

The most important conclusion of this project for the physical sciences is that the world as described by the physical sciences is on the outside of our world of experience, the "multiverse". Although this makes the world of matter, the universe, a society of entities far removed from our experience, it does not change any of the basic laws or premises of the sciences.

This model confirms some of the assertions of solipsists and personal idealists while relativizing those assertions. The means by which our personal reality comes about affirms the existence of others in the universe, though not necessarily in our multiverses. We create our own reality (multiverse), but this is really re-creation of a universe that has an existence apart from any one of us.

The major conclusions for theology are a result of the correlation between brain physiology and the quality and content of altered state of consciousness. Much of what has been said about God, heaven, hell, angels and demons may be attributed to physiological structure or function. The quest for an inclusive vision, a way of looking at the human phenomenon which accounts, or at least makes room, for all of the facts of experience must take account of both the universe and the multiverse. The tendency of the world toward increased complexity and

contrast is reflected in the complexity and mental/physical nature of our experience. With two minds, situated in two worlds, we are in a peculiar position. Scientists say that the universe is all there is and mystics say that the multiverse is more than just the universe. Through the model constructed, both can be seen as correct as far as they go, but each is in need of the contributions of the other. Objective and subjective disciplines have here a model for dialogue that I pray may be of use to both.

## CHAPTER I

### INTRODUCTION

This project concerns the need for a conceptual cosmological model for dialogue between objective and subjective disciplines.

Since the scientific revolution in the Seventeenth Century, the influence of the worldview presented by the Church has steadily declined. The reduction of the three stage universe to the status of a pious myth by the discoveries of Copernicus, Galileo and other scientists has greatly contributed to a crisis of faith. Belief in a heaven or a hell, the existence of God or the efficacy of the sacraments has become increasingly difficult to many because of the materialistic worldview that pervades our society and most of the civilized world. With the discovery of heliocentricity, no room was left in the universe for a heaven or a hell. God became a projection of our subconscious desire for an authority figure. Descriptions of visions of angels or demons or other mystical experiences are viewed with suspicion or dismissed as pious fantasy by most of our society. Although many believe in a God, a "Supreme Being" or even a "Ground of Being", such beliefs are relegated to a lesser role in the value structure of most persons. God seems more relevant to the dying, as most of our society sees God as Someone to be

experienced only after death. Many people do not even pray because it is difficult to have a meaningful conversation with someone who isn't believed to be there.

It is my belief that God is not only "there" but is ultimately the only "reality" that we can experience. I believe that spiritual values rather than material values are of the highest priority. I further believe that a false materialistic value structure is the product of a materialistic worldview and that religious values may not be infused into such a system, but must come naturally as the result of the adoption of a different worldview. The attempt of the Church to "Christianize" the value structure of our materialistic culture is doomed to failure so long as the primacy of the materialistic worldview goes unchallenged.

For this reason, I see the project I have here undertaken as one of utmost importance to the life of the Church and the spiritual well-being of humankind.

### Thesis.

My thesis is that the physical sciences and particularly brain physiology and the means of induction and characteristics of altered states of consciousness may provide a model for the facilitation of dialogue between objective and subjective disciplines.

By physical sciences I mean physics, chemistry,

biology and physiology. By brain physiology I am referring to the structure and function, as well as the ontogeny of the brain. The way the brain develops, what form it takes and the way it works represent mysteries which, while not completely understood by modern science, are better understood today than at any time in the past. Although I am not alone in my attempt to use brain physiology as a basis for making theological or metaphysical statements, most scientists are poor students of these subjective disciplines and tend to oversimplify or underestimate their complexity. Having been trained in both the physical sciences and the theological disciplines, I feel that I am uniquely qualified to undertake the task of relating brain physiology to the subjective disciplines. When I use the term consciousness I am referring to any mental experience of a human being. This is different from the ordinary language use of this term in that we might say that when asleep, one is not conscious. But a sleeping person or any other actual entity for that matter, does have some form of experience in that state and so I will call it consciousness. Because waking and sleeping are very different kinds of experience, I will use the term "state", after the manner of Charles Tart,<sup>1</sup> to connote any discrete form of consciousness. The form of consciousness

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<sup>1</sup>Charles T. Tart (ed.) Altered States of Consciousness (New York: Doubleday, 1969), p. 1.

you now experience I will call ordinary waking consciousness (OWC) and all other states will be referred to as altered states of consciousness (ASC). By a model I mean a description of both the presentationally immediate subjective experience and the physical causation that engenders it, which will be both adequate to the facts of human experience and consistent with most reasonable descriptions, regardless of cultural origin, of the universe. By dialogue I am referring to a process by which two or more parties can both give and receive ideas. To illustrate, let me give an example of what I have in mind. Swedenborg, a mystic (among other things) developed a detailed description of the world of spirits as comprised of several levels of heaven and several levels of hell. All of this he claimed to have seen in a trance state. Scientists of his day dismissed it as nonsense and most would today. However, Van Dusen, a psychiatrist, has found his mental patients' accounts of their hallucinations as conforming without exception to Swedenborg's model.<sup>2</sup> Although Van Dusen could have rejected Swedenborg's model as fantastic, for it was impossible to rationalize Swedenborg's model with a modern worldview, he chose instead to listen to the facts as presented and give a

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<sup>2</sup>Wilson Van Dusen, "Hallucinations as the World of Spirits," in John White (ed.) Frontiers of Consciousness (New York: Julian Press, 1974), pp. 66-87.

different interpretation. A simpler example is that of a WWII military officer who was informed by a native that a giant metal bird had regurgitated a number of iron elephants into a field. Instead of rejecting the story as fantastic, for obviously there are no such things, he correctly surmised that a plane had disembarked a number of tanks and prepared his defenses accordingly. Like that officer, I see an interpretation of the facts of experience that harmonizes many apparently conflicting viewpoints. By objective and subjective disciplines I am referring to broad categories of these disciplines. Some of the disciplines I class as objective are mathematics, physics, chemistry, biology, physiology and behavioral psychology. Those I class as subjective are philosophy, theology, metaphysics, mysticism and insight oriented psychology. Humanistic and transpersonal psychology could both be classed in the twilight zone between objective and subjective.

#### Current Status.

It is difficult to talk about the current status of the kind of project I have undertaken because synthesis of disparate disciplines is not recognized as a field in our society. Most scholars, while remaining rational within their own fields of study, make little attempt to correlate their fields as a whole with more than a few

closely related fields. A chemist might be willing to rationalize his work with that done on physics and biology, but would not consider rationalizing it with Hindu cosmology. I have chosen to create a model based on the phenomenology of experience. Since we experience both physical objects and non-physical subjective phenomena, experience is the ideal area for construction of a model which will synthesize a broad spectrum of disciplines into an integrated whole. While mathematics or business law may not have much in common with my thesis, they are not in conflict with its basic premise. It is my belief that all applicable disciplines may be seen as support for my thesis.

A number of persons have done work that is similar in some respects to that presented here, but they all suffer alike from one of two general problems. The first group are scientists who attempt to reduce extraordinary experience to just physiology without considering the implications of such a reduction. Freud, Skinner and many others fall into this category. The second group appear to be on the right track in that they give full credit to the contributions of other fields, but their approach to theology or physics, as the case may be, is from so unsophisticated a position as to reduce the validity of their arguments in the eyes of serious students of the particular discipline involved. It is my belief that the



following is of sufficiently advanced quality in both objective and subjective disciplines as to be acceptable by both scientists and theologians as a progressive contribution to both fields.

The system developed by Alfred North Whitehead is a similar attempt at rationalization, but with the disadvantage of being so complex and revolutionary that few are capable of making use of it. While my system is not in disagreement with his, it is more easily grasped and does not require one to learn a new language.

#### Method.

The intent of the project proposed is to consider some points in brain physiology, including its structure and functions; to consider a number of surveys of altered states of consciousness; to construct a model of "what is happening" that is both adequate and consistent with all of the facts; finally to consider how this model may be used to facilitate dialogue between any number of subjective and/or objective perspectives of human experience.

I will have room in this project to consider only a sampling of the applicable data from brain physiology, mystical literature, various cosmologies and religions. The point is to indicate more the direction in which a common denominator may be found than by a careful delineation of the specifics of such a solution. Only a few of

the applications of this model will be considered, but these will be done in such a manner that a pattern of application will become apparent.

Integration is really the theme and the method of this project. For too long we have been without an inclusive vision of our world. Compartmentalization and specialization has been the key to much of our technological progress but the result has been an apparent disparity between objective and subjective worldviews. Like Fifth Century Byzantium where science, religion, politics and economics were perfectly integrated by the Christian worldview into a life that was of a whole, I hope that the model which will be created in this project may serve as a springboard for future literary works that will forge an inclusive vision of existence.

The basic concept involves recognition of the fact that our experience is created within a body. Although we live in a post-Copernican universe, the fact that our experience of the universe is recreated by the brain in a number of different ways in different states of consciousness suggests that while we are objectively in a one-stage universe, termed here the universe, we are subjectively in a multi-stage universe that I will call a multiverse. This recognition is the bedrock on which an inclusive vision of experience may be built. Thus all theological, mythical, mystical, psychological or scientific

views of human experience become both relevant and relative.

To accomplish this goal I will use primarily library research, but behind the work evident in this paper stands twelve years of reading and consideration. The truth is that I saw this concept in a flash as a mystical experience. Like most mystical experiences, it was so rich and complex that for years I was unable to explain even a small part of the vision. Only continuous reading and thinking and feedback from people I have tried to tell it to, as well as the valuable tools gained by a first-rate seminary education, have brought me this close to communicating some of the import of that original experience. With the understanding that it would be impossible to retrieve all of the sources from which the following was developed, I have endeavored to amass a sufficient amount of data to lend credence to the proposed model.

Actually, any number of facts would be sufficient to imply the proposed model once the whole is perceived. It is like the seven blind men and the elephant. Each mistook the part for the whole. Although I may be guilty of the same error, I have the feeling that I have seen the elephant and that once seen as a whole, any two or three parts suggest the whole. To use a more applicable example, once you arrive at a surprise party given in your honor, a number of otherwise then unrecognizable incidents from

the preceding days now take on appropriate significance and you have the feeling that you should have known all along. In the same way, I have the feeling that everything points to this model and I must have been blind not to have perceived it before. Thus, given one hundred extraneous facts, I could take any twenty of them and come up with this model once I knew what to look for. The group of facts I have chosen are not the only ones that would support my thesis, but does contain a representative group.

Although this paper may not reflect it, my principal method in the construction of the model has been reflection on my own and other's mystical experiences. Therefore, surveys of mystical literature have been used extensively. However, this point has required me to amass an amount of material after the fact and as a result, much of my documentation may have the flavor of proof-texting. I have taken great care to balance and include a sufficient amount of data from both objective and subjective disciplines to support my thesis.

According to the metaphysics of Process Thought<sup>3</sup> as developed by Whitehead, everything in the universe that we presently think of in common sense language terms as matter has both a physical and a mental pole. Because I

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<sup>3</sup>Alfred North Whitehead, Process and Reality (New York: Macmillan, 1929, 1969), pp. 27ff.

find this metaphysical assertion persuasive, I believe that any model adequate to the facts of experience should consist of both a physical and a mental aspect. Further, because the purpose of this paper is to facilitate dialogue between objective and subjective disciplines, I find it necessary to consider both the physical sciences and the subjective disciplines in the formulation of an adequate model of human experience. This amounts to the consideration of the "body and mind" from the appropriate disciplines. Accordingly, I have chosen to consider first a description of the ontogeny, structure and function of the human body and brain as the contribution of the physical sciences toward the construction of the proposed model. On this subject there is a large degree of consensus on the part of scientists. But when we consider the number of the religions, cosmologies, theologies, philosophies and psychologies which have been and are being ascribed to, it becomes somewhat of a problem in the selection of a best beginning point to achieve an overarching view. Because the Whiteheadian perspective suggests that each "physical prehension" is ultimately "enjoyed" as an experience,<sup>4</sup> I have chosen "consciousness" or awareness as the most fruitful starting point.

Because the "mind" or mental aspect of humanness

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<sup>4</sup>Ibid.

is subject to a variety of states of consciousness, I have found it necessary to consider altered states of consciousness (ASC) as well as ordinary waking consciousness (OWC) as the way of getting at the contribution of the subjective disciplines toward an understanding of human experience. Thus, the second major section of this project is organized around the induction and characteristics of ASC. Here each item is considered both objectively and subjectively and as such represents a dialogue between objective and subjective disciplines. These two chapters together constitute the proposed model for the facilitation of dialogue. The succeeding chapter is designed to recapitulate the model in common sense language and consider other areas of application and suggestions for further elaboration of this model.

## CHAPTER II

## PHYSICAL POLE

Introduction.

The purpose of this chapter is to consider a human being and particularly the human brain, from the perspective of the physical sciences. The body, however, is made up of organs which are made up of tissues which in turn are composed of cells. Cells are composed of macromolecules which are complex arrangements of atoms. Atoms are composed of electrons, protons and neutrons which are composed of subatomic particles. The process perspective on humanness sees each of these groups as representing societies and the whole body as a society of societies of societies, etc.<sup>5</sup>

To gain the most overarching view of humanness from the perspective of the physical sciences, it is necessary to go back to the beginning.

Physics.

The most popular theory as to the origin of the universe among contemporary astrophysicists is the Big Bang Theory. There are several variations on this theory

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<sup>5</sup>Ibid., pp. 39ff.

but the most widely held states that approximately 15 billion years ago all of the matter and energy in the universe were collected together in one place, perhaps a gigantic "black hole".<sup>6</sup> It is further theorized that this mass exploded and in so doing expanded outward on a 40 billion year journey at which time it will, because of the gravitational attraction of the rest of the matter in the universe, reverse its course and return to the center in another 40 billion years.

This original explosion dispersed as a cloud of subatomic particles. These particles were attracted to each other. It is here that the creation begins to exemplify a metaphysical characteristic that is at the base of all subsequent stages. The particles attract and draw each other together to a locus and are then repelled. Two atoms will draw each other from miles away and continue attracting one another until they are a few hundred radii apart and then they repel/attract each other so as to maintain a more or less constant distance relationship. This distance remains the same until a sufficient number collect in one locus and a critical point is reached, that I will call a threshold, at which point the distance decreases. As matter continues to accumulate, succeeding thresholds are crossed with the "black hole" as the

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<sup>6</sup>Carl Sagan, The Dragons of Eden (New York: Ballantine Books, 1977) p. 13.



theoretical limiting example.

Considered structurally then, subatomic particles, of which four kinds have been discerned, organize themselves into electrons, protons and neutrons. Each of these three basic kinds of particles is chemically interchangeable with any other particle of the same kind. So, for all practical purposes, electrons are all identical, as are all protons and all neutrons. Once these lesser subatomic particles have grouped into electrons, protons and neutrons (the greater subatomic particles), three more values become apparent. These are order, complexity and contrast. There is order because of the attraction/repulsion that established definite set orbits for subatomic particles about one another. This attraction/repulsion also tends to increase the complexity. Thus, order and complexity are interdependent values. Contrast, prefigured in the attraction/repulsion of lesser subatomics becomes the positive/negative of protons and electrons. This is the original manifestation of contrast, the third primary value derivable from observation of elemental particle physics.

Functionally this contrast, known in chemistry as electronegativity, is the principle whereby all chemical activity is initiated and in terms of which all chemistry is explicable. When we further consider these basic particles functionally, another characteristic appears;

each of these subatomics has survived intact for 15 billion years, with each occasion repeating itself or, more precisely, becoming the next occasion, functionally identical with the preceding one, millions of times a second, and will continue to repeat this process for another estimated 65 billion years. Repetition, then is the last of the characteristics here drawn from physics.

To summarize, there are two metaphysical characteristics and three values drawn from an overview of physics. These characteristics are temporal succession and repetition. The values discerned are increased order, complexity and contrast.

### Chemistry.

When contrast and exploding stars had caused the order and complexity of atoms to increase to the point that our solar system was formed, a particular environment on the surface of this planet contained a great number of very large complex molecules, with some known to the organic chemist as hydrocarbons. Teilhard de Chardin calls this the "polymerizing world" because the structured accretion characterized by many organic compounds mimics the growth of living things. These macromolecules combined to form proteins and ultimately life's biological nucleic acid building blocks, RNA and DNA. With the increase in complexity of the structure of these molecules, a threshold

is crossed. Some of these molecules, if broken, will reproduce the missing parts in the same order as before the break.<sup>7</sup> These preliving molecules, answering a call to exemplify increased order and complexity over an extremely long period of time, organized themselves into cells.<sup>8</sup>

The course of evolution, to the point of the emergence of animals with central nervous systems, continues to exemplify the principles of repetition and temporal succession.

### Biology.

Order and complexity greatly increase with the emergence of molecular life and concomitantly two presupposed but unmanifest values become apparent. The freedom possessed by atoms, however small, is effectively cancelled out by the uncoordinated freedom of other atoms in the aggregates present prior to life. But the emergence of the cell, with its ability to move where it wills propelled by cillia or whatever, means there is a quantum leap in manifest novelty of response to given stimuli. It is also at this point that the subjective aspect of being becomes apparent. The increased complexity of structure and function in a cell will naturally result in an increase in

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<sup>7</sup>Pierre Teilhard de Chardin, The Phenomenon of Man (New York: Fontana Books, 1966), p. 6.

<sup>8</sup>Sagan, pp. 13-17.

the significance or intensity of the experience of the mental pole of the cell. Thus, the values of novelty and intensity, innate in subatomics, becomes manifest in cells.

About three billion years ago microorganisms evolved sexual differentiation. This is a fundamental contrast exemplified by almost all succeeding organisms and all animals. The genetic recombinative possibilities introduced by this development is the principle underlying the subsequent acceleration of the evolutionary process. Again, contrast leads to increased complexity and intensity.

What happens to the subjective aspect of being at this point reflects an increase in intensity of feeling. The mental pole begins to be more significant as the complexity of organisms increases.

At this point it is necessary to introduce a distinction. By the use of the word mentality, up to this point, I have meant the enjoyment by individuals of a subjective experience of a definite feeling. Such experience is enjoyed by subatomics, atoms and now cells, with an increase of intensity of feeling produced in increasingly complex organisms by force of a unity of form or structure. This gives rise to hierarchical order. That is, subatomics have individual experiences, but when structured atomically, have a unified experience and thus move and function as a unit. Macromolecules, organelles, cells, organs and finally organisms each represent

subspecies of structural units in a hierarchical order with each unit having a unity of feeling. As one would expect, each unit manifests mentality or mind in direct proportion to complexity. Thus, the distinction between orders of mentality should be considered as mind becomes increasingly significant by force of its complexity.

Mentality manifests itself in the ability to store and communicate information related to accomplishment of tasks in response to internal or environmental stimuli and to manifest this information as action. Iron just knows how to be iron but a cell can eat, excrete and create a novel replication of itself. As an organism becomes more complex, this information storage process is increased by specialization of function for this purpose. Such increase in complexity is accompanied by an increasingly complex unity of feeling and response to stimuli brought about by the principle of associativity. By this principle the brain states that the human brain is capable of assuming is equal to the number 2 raised to the  $10^{13}$  power, while the total estimated number of electrons, protons and neutrons in the entire universe is less than the number 2 raised to the  $10^3$  power.<sup>9</sup>

But just as matter undergoes quantum changes in density with increased massiveness, so mentality undergoes

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<sup>9</sup>Ibid., p. 43.

quantum changes in experience, with increases in complexity. Thus, with the advent of central nervous systems there were exponential increases in mentality culminating in humans. Such increases have been archeologically demonstrated to be exponential with time.<sup>10</sup> The thrust of the above is to show that the mentality enjoyed by us is not something new but is continuous with the lower orders of mentality, differentiated only by complexity.

### Physiology.

It has been said that ontogeny recapitulates phylogeny. That is, as the human fetus develops from one-celled zygote into a fully formed child, the stages of its development are similar to the stages of the evolutionary chain that culminated in humans. This principle conditions the structure and function of the human brain.

Levels. Dr. Sagan describes three basic divisions in the structure of the human brain. The most primitive region, which is the lower part of the brain, is called the Reptilian complex or R-complex. This region corresponds in function and structure to that of the reptilian brain and is shared by all higher animals. The function of this brain region is associated with maintenance of body systems and need satisfaction. It is also hypothesized that

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<sup>10</sup>Ibid., p. 26.

aggression, ritual, territoriality and establishment of hierarchies stem from this area.

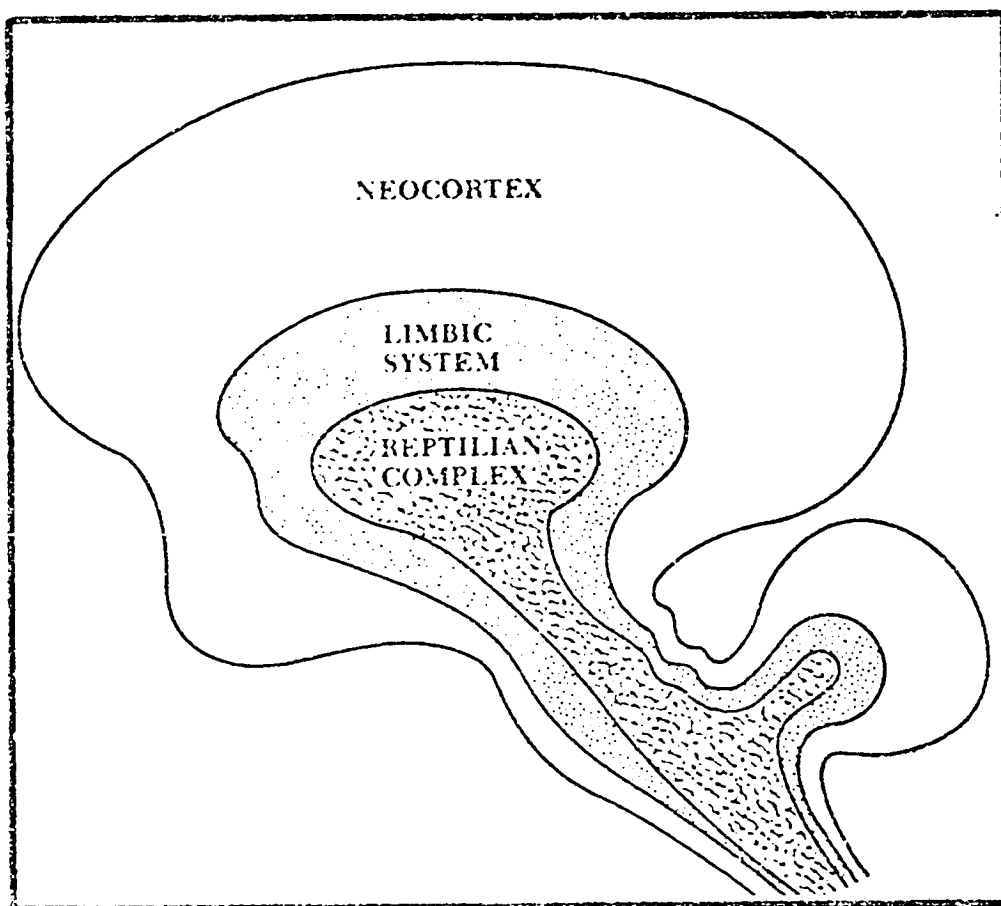


PLATE I

Levels of the Human Brain<sup>11</sup>

Surrounding the R-complex is the Limbic region.  
We share this region with other mammals but not with

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<sup>11</sup>Ibid., p. 59.

reptiles. It is believed that emotion, parasympathetic function, altruism and religious feelings are associated with this area.

Surrounding the Limbic region and comprising 85% of the human brain mass is the neocortex. We share this development with the higher mammals and primates. The ratio of the mass of this region to the rest of the brain is directly proportional to the position on the evolutionary hierarchy. That is, generally the more recent a species, the higher the ratio. It is to this area that we ascribe judgment of consequence, which is interpretation of signals and all higher conceptual functions.

Hierarchy. The brain's activity in relation to the body is a process of repressive control. For example, the heart will beat faster and faster as brain control breaks down. Muscles will cramp when motor areas of the brain are inhibited. Therefore, the three levels of the brain just described form a hierarchy of repressive control. For example, heart function is normally controlled by the R-complex but this control can be modified by emotional states. Further, emotional control can be usurped by conscious effort, through training, such as yoga or bio-feedback. Conversely, if cerebral or neocortical functions are inhibited (i.e. alcohol), Limbic or R-complex regions will assume control. This is probably the reason that persons tend to display more emotion when slightly



intoxicated and more aggressive behavior when very intoxicated.

The human body receives stimuli from the environment and within itself, which it relays to the brain. There these signals are transmuted into a representation of the environment. Common sense tells us that this representation is in tune with the environment in that it retains the vector characteristics of the environment. In a very real sense, we create our own reality. This point will become important in later sections.

States. A second point worth noting is that the human brain is characterized by continuous electrochemical activity that is associated with various states of consciousness. A scientific schematization of this process through the use of biofeedback and EEG is referred to as brain waves. These waves, when measured in cycles per second (Hertz or Hz) and correlated with subjective experience, divide into four broad categories:

<u>State</u>	<u>Hertz</u>	<u>Characteristic</u>
Beta	12 plus	waking
Alpha	7-12	light sleep
Theta	3-7	hypnotic state
Delta	0-3	deep sleep

Figure 1.

States of Consciousness

Wave activity is not localized in any particular part of the brain, so it is assumed that all levels of the brain are involved in all of the above states, but to what degree is a matter of debate.

To aid in the clarification of what is happening in various states, let me suggest the following figure:

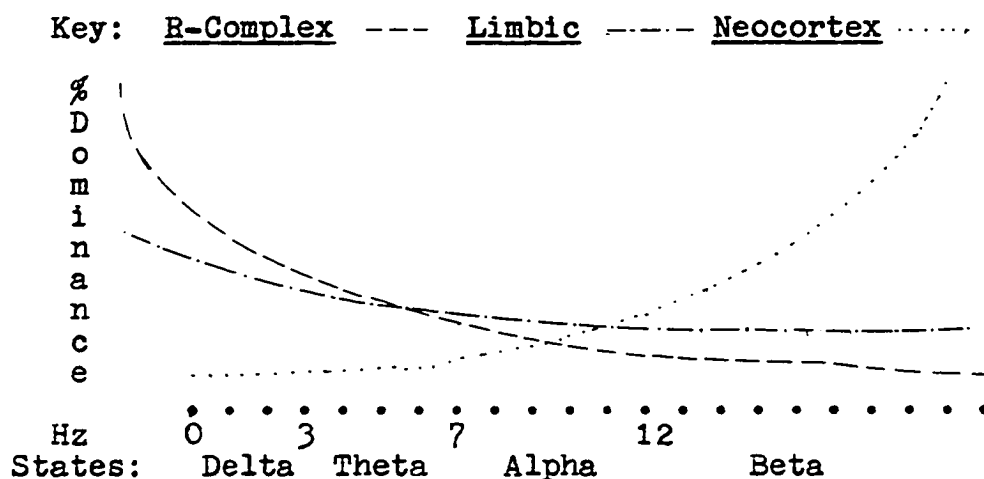


Figure 2.

#### States vs Level Dominance

The above figure is not meant to be understood as quantitatively accurate, but to suggest directions. At all Hz, the R-complex continues to control metabolic functions and from 0-3 Hz, it is dominant. At some point between 0 and 7 Hz the Limbic region begins to dominate the R-complex and at some point after 12 Hz, the neocortex assumes dominance.

The control of the state of electrochemical

activity in the various levels of the brain is generally ascribed to the Reticular Activating System. Located at the upper end of the brain stem, this system consists of two coordinated sets of pathways extending up into the neocortex and down into the lower brain and brain stem.<sup>12</sup> It is the function of this system to control "cortical tone" which is the state of electrochemical activity in the neocortex necessary for ordinary waking consciousness.<sup>13</sup> The system works in such a manner that the ascending pathways "activate and regulate" cortical activity while the descending pathways provide for cortical control of the lower brain and brain stem.<sup>14</sup> These pathways then are associated with the functions of awakening and going to sleep. This amounts to control of the brainwave frequency.

Another structure worthy of note, shown in Plate II, is ". . . the anterior end of the cerebral aqueduct and the posterior end of the fourth ventricle . . . the first internal structure to appear in pregnancy".<sup>15</sup> As a person dies, the electrochemical activity of the brain retreats to this area and this process is called "the stages of

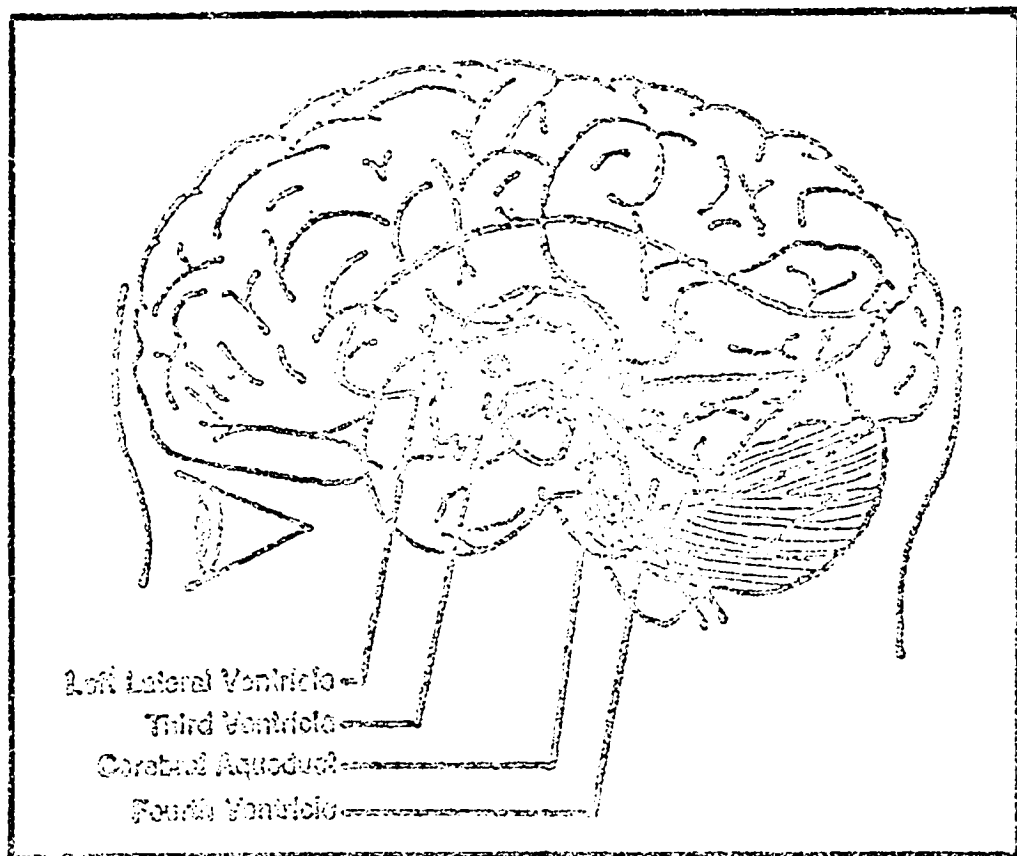
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<sup>12</sup>A. R. Luria, "The Brain's Three Principal Functional Units," in Daniel Goleman and Richard Davidson (eds.) Consciousness: Brain, States of Awareness, and Mysticism (New York: Harper & Row, 1979) pp. 10-11.

<sup>13</sup>Ibid. <sup>14</sup>Ibid.

<sup>15</sup>Henry Conway, "Life, Death and Antimatter," in White, p. 284.

anaesthesia", a path that is the "reverse of normal growth and evolutionary development".<sup>16</sup>



## PLATE II

### Ventricles of the Brain<sup>17</sup>

Hemispheres. The brain is divided into two halves each of which is associated with the particular mental functions. The discovery by A. L. Wigan in 1844 upon the

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<sup>16</sup>Ibid., p. 283. <sup>17</sup>Ibid., p. 284.

autopsy of a man with only one hemisphere, led to the conclusion that only one hemisphere was necessary for a person to appear to function normally. The possession of two hemispheres, the normal state of affairs, would imply that we have two minds. "Neowiganism"<sup>18</sup> then is the theory that we are ". . . possessed of two minds which differ in content, possibly even goals but most certainly in respect to mode of organization".

Much has been made of this concept by Julian Jaynes in his book "The Origin of Consciousness in the Breakdown of the Bicameral Mind".<sup>19</sup> It is his contention that for right-handed people, the right brain possesses the traits attributed to gods; pattern recognition, overview, comprehension, intuition, guiding and planning action in novel situations, etc. The left brain is associated with the dominant mentality of persons, language, speech, thinking, etc.<sup>20</sup> He believes that prior to the Axial Age (c.800 B.C.) the left brain related to the right brain as a human to a god.<sup>21</sup> Thus, he sees much of ancient religion, particularly idolatry, as an outgrowth of this dichotomy.

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<sup>18</sup>David Galin, "The Two Modes of Consciousness and the Two Halves of the Brain," in Goleman and Davidson, p. 21.

<sup>19</sup>Julian J. Jaynes, The Origins of Consciousness in the Breakdown of the Bicameral Mind (Boston: Houghton Mifflin, 1976)

<sup>20</sup>Ibid., pp. 117ff.

<sup>21</sup>Ibid.

Plate III provides a good visual representation of the foregoing paragraph.

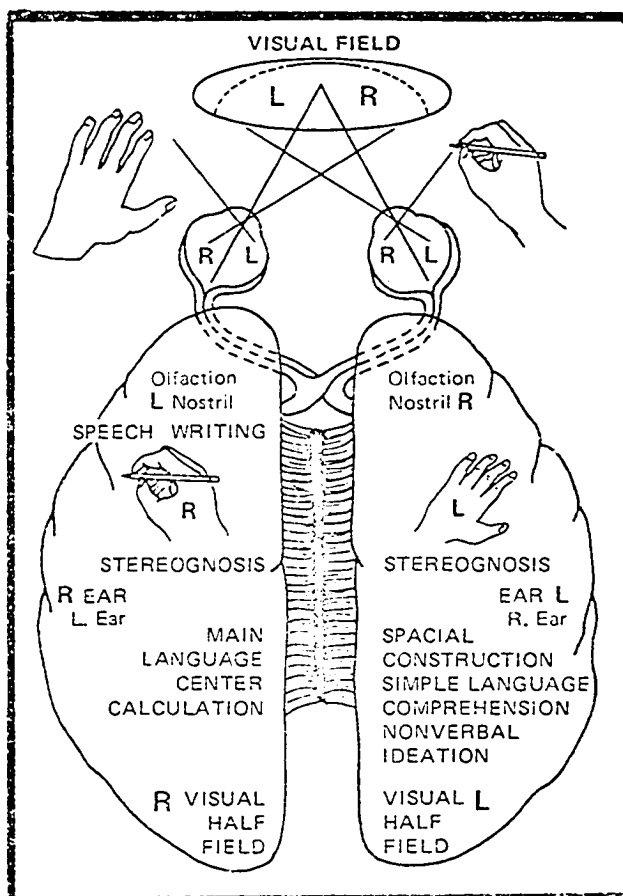


PLATE III

### Brain Hemispheres<sup>22</sup>

However, E. Roy John published a paper the same year in which he described experiments that suggest that

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<sup>22</sup>Galin, p. 21.

". . . vast portions of the brain are involved in every thought process and that the response is graded".<sup>23</sup> That is, the first time one sees an object it is the classical visual centers that are activated, but repetitions of the stimulus activate successively more areas of the brain. Thus, both Galin<sup>24</sup> and John warn against overenthusiastic use of "split-brain" phenomena or as Kinsbourne calls it, "dichotomania".<sup>25</sup>

State-bound knowledge. The human brain is subject to various states of function. These are specific states because of the state-bound knowledge phenomenon. We have all had the experience of not being able to recall a dream even moments after awakening. Roland Fischer describes this phenomenon as obeying the basic principle that, since the knowledge in each SOC is stored differently in the brain, the further apart two SOC are, the more difficult it is to share their respective knowledges.<sup>26</sup> That is, one must be in the same or similar SOC as when the knowledge was gained to have optimum access to its memory. Fischer reports, "One therapist says that when he uses sodium amytal (truth serum) as part of psychotherapy, his

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<sup>23</sup>E. Roy John, "How the Brain Works--A New Theory," in Goleman and Davidson, pp. 14-15.

<sup>24</sup>Galín, p. 23.

<sup>25</sup>Ibid.

<sup>26</sup>Roland Fischer, "State-Bound Knowledge," in Goleman and Davidson, p. 91.

patient picks up his narrative each time exactly where he left off at the close of the previous session".<sup>27</sup> Because of this phenomenon there is a partial or total amnesia between states. This probably is part of the reason that mystical experiences are so difficult to communicate, they are experienced in states of consciousness that are vastly different from OWC. Thus, when we consider the wide spectrum of ASC it becomes apparent that each state constitutes its own world. Time-scale, distance, meaning, body image, knowledge and personality can all be said to be particular to a state of consciousness. All or most of these factors change in ASC whether that ASC is sobriety, drunkenness, sleep, mystical consciousness or high anxiety.

Rebound phenomena. Associated with this phenomenon is that of "rebound". By this is meant that as the level of arousal rises, a point is reached at which a state of tranquility, like that experienced in Zen meditation, is reached.<sup>28</sup> Conversely, as very low levels of arousal are approached, as in yogic meditation, SOC are encountered like the "ecstatic awakening of Kundalini".<sup>29</sup> It is as though the two poles of the spectrum of ASC were the same or that the spectrum is really a cycle or circle.

Body image. Various portions of the brain are

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<sup>27</sup>Ibid., p. 92. <sup>28</sup>Ibid., p. 91. <sup>29</sup>Ibid.





the back end of the brain. Although it is true that we see with the eye, if one were to cut any portion of the pathway prior to the end in the neocortex, as in the rightmost representation of Plate V, then there is a resultant loss of a portion of the visual field. The sensory input from the body is sent to the brain via electrochemical impulses and is "experienced" by the dominant occasion. Thus, the brain is the site of a sensory representation of both the body and the environment.

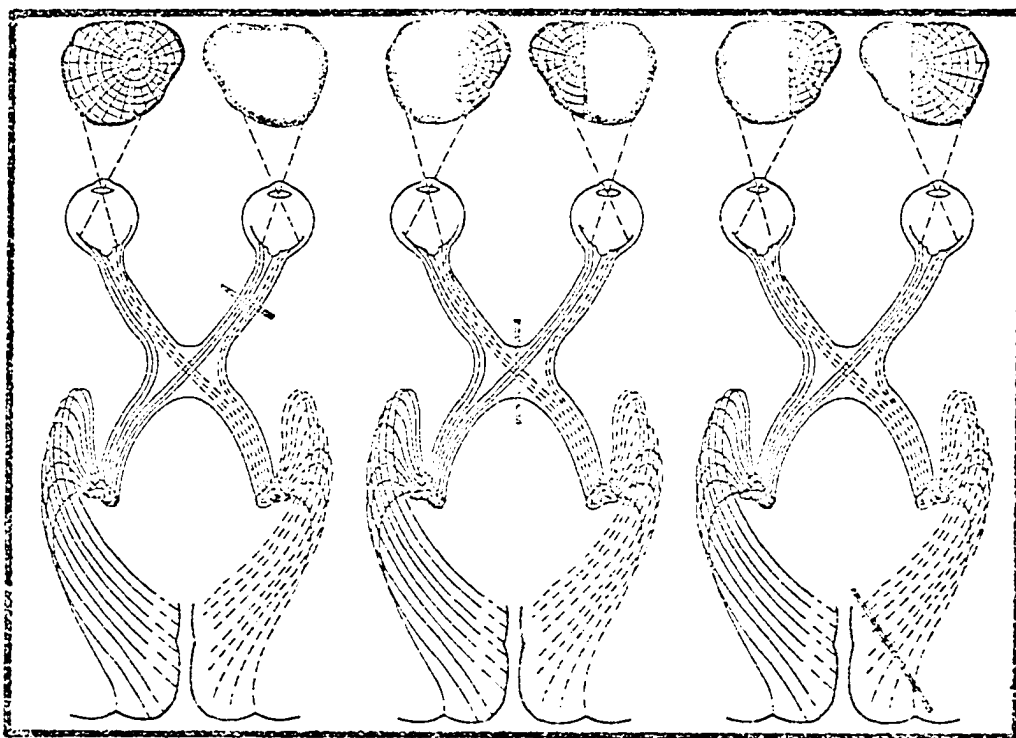


PLATE V

Damage to the Visual System<sup>31</sup>

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<sup>31</sup>Clifford T. Morgan and Richard A. King, Introduction to Physiology (3d ed.; New York: McGraw-Hill, 1966) p. 706.

There is a well-known visual phenomenon that demonstrates this evaluation. Morgan reports that if one wears a pair of glasses that invert the visual field, the brain will turn the image right side up in about two weeks.<sup>32</sup> Then if the glasses are subsequently removed, an inverted image will result, but the brain will reinvert the image to its original position in two more weeks.<sup>33</sup> It is apparent that the world cannot be turned upside down with a pair of glasses, but an image of the world can be inverted, distorted or tinted with a pair of glasses. However, "the world" is out in front of us. The synthesis of these facts is that the world we see, the visual image which may be inverted with glasses, is out in front of us. If we remove the unnecessary language, the image before us is in our heads. At the end of our image of the universe, is the inside of our skulls.

### Physical Model.

Instruction. To properly understand the text, it is essential that Figures 3 and 4 be referred to throughout this section.

Proposed model. All of Figure 3. will represent the universe. Person one and Person two are two people. Multiverse of person one is the multiverse or image

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<sup>32</sup>Ibid., pp. 366ff. <sup>33</sup>Ibid., pp. 272ff.

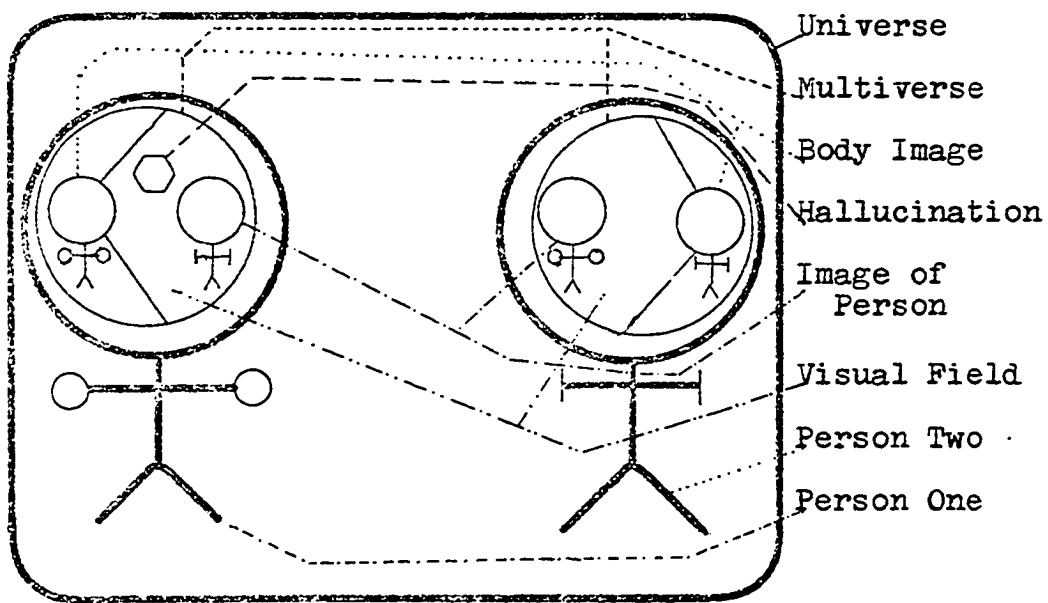


Figure 3.

Proposed Model

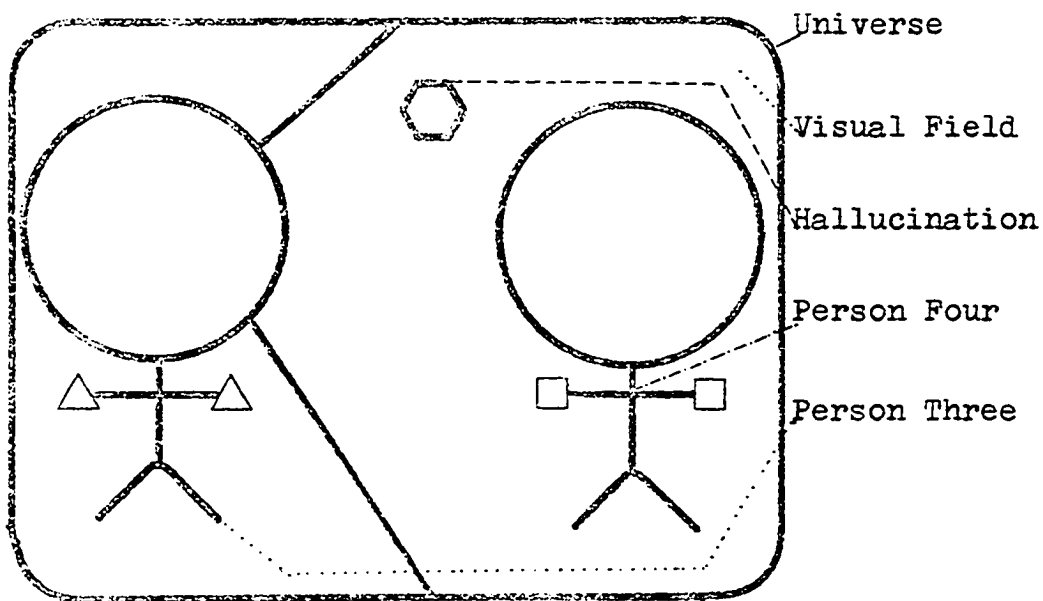


Figure 4.

Common Sense Model

construct of the universe created by the body and brain of Person one. Likewise, Multiverse of person two is the multiverse created by Person two. Visual field of person one and Visual field of person two are the visual fields of each. Body image of person one and Body image of person two are the body images produced in the brain of Person one and Person two, respectively. Image of person two and Image of person one are the images of Person two and Person one recreated in Multiverse of person one and Multiverse of person two of Person one and Person two, respectively. Hallucination of person one will represent a hallucination in the visual field of Person one. Note that the hallucination does not appear in the universe. Multiverse of person one is not meant to be seen as in proper shape and proportion. A more accurate representation is shown on Plates IV and V. The physical correlates--brain cells, electrical and chemical processes--of this image, Multiverse of person one, are in a configuration within the brain that is folded, inverted, reversed and shrunken in comparison to the actual shape of Person one and the universe. However, Figure 3. is given to emphasize the point that both the sensory image of the body, Body image of person one, and of the environment of Multiverse of person one are recreated as sensory experience in the brain of Person one. A recognition of the relevance of this general configuration may be better understood if it

were contrasted with the common sense experience of the world that I contend is both erroneous and responsible for the primacy of material values.

The common sense experience of the universe might be as represented by Figure 4. For the sighted, Figure 4. represents the general configuration of common sense experience in the world. Person three is the person whose common sense experience is to be examined. Person four, another person, is in the visual field of Person three. Hallucination of person three will represent a hallucinated object in the visual field of Person three.

Person three experiences both Person four and a hallucination as being some distance from himself. Person three knows the shape and color of Person four by way of deflected light which enters the eye of Person three and stimulates a nerve train culminating in the occipital cortex. But, Person four is experienced as being "out there". We know of course, that Person four really is out there, because he is in both the universe and the Visual field of person three.

A problem now arises with the Hallucination of person three as we know that it does not have a physical correlate in the universe, but does appear in the visual field. We also know that the hallucination is created in the brain of Person three. But, it also is "out there". How can this be so? Does the brain of Person three have

the ability to project an image outside of his body? What does he project this image onto? If a person is asked to visualize an apple before them, that can be done. But, how does the apple get "out there"?

Now if we consider Figure 3. again, which represents reality, there is no need to posit some magical projection ability. The Hallucination of person one may be easily accounted for as a creation of his brain. The common sense understanding is in error, in that the Visual field of person three, which is his visual field, is thought to be outside his body, whereas the truth is that the Visual field of Person three is part of the Multiverse of himself, as indicated on Figure 4. An image of a hamburger and a hamburger are two different things. Yet, Person three mistakes Person four as being a person and not an image of a person. It would be like Person one thinking that the Image of person two and Person two are identical.

#### Discussion.

My interpretation of the above is that we are in two universes. One is a universe which follows the laws of physics. The second is a multiverse or construct of the universe. How it recreates the universe is dependent upon the state of consciousness and the condition of the body and its placement in the universe. In ordinary waking consciousness one can forget this multiverse and most of

us do, I believe, and I have only my faith to support it, that the body faithfully reproduces the contents of the one-stage universe so that one can live as if the universe is all there is without fear that we are being fooled. Of course, we know that color and some of the other qualities of the contents of our presentationally immediate experience are the products of our brain and body and not actually qualities of the perceived object.<sup>34</sup> But when I hold a pen as I do now, I really believe that it is "real". This is not so. My body holds a pen but the thing I experience has color and other brain produced qualities, unlike the reality, and is a figment or creation of my brain, although a representation of one. However, I have to continue accepting the reality of these objects because were I to jab this image-pen into my image-hand I will feel all of the pain one would expect from a "real" pen, because in truth a real pen stabbed a real hand and although I only experience the image of the process, it feels real and the real hand is really stabbed. A doctor, trying to mend this wound will tend to an image-hand that his brain is producing, but the "real" doctor fixes a "real" hand outside of our separate realities. I do not want to belabor the point, but I do want to make it clear that we experience the one-stage universe as real even though it

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<sup>34</sup>Ibid., pp. 272ff.



is on the outside of our universe.

## CHAPTER III

## MENTAL POLE

Consciousness.

As the last chapter was an investigation of the physical pole of our being, this chapter will be an investigation of the mental pole. Our awareness is the subject of much controversy. Although it is associated with electrochemical activity in the brain, neither the substance or exact location of awareness or consciousness has been established. The Process Thought solution is that it is an experience enjoyed by all of the subatomics, atoms, cells and the body as a whole, since all "actual entities are drops of experience".<sup>35</sup> But, the dominant occasion of experience does not experience all of the experience or awareness available, at least in OWC. There is an electrochemical barrier to stimuli entering consciousness that is called a threshold.<sup>36</sup> A stimulus has to be of a certain intensity or it is screened out of our awareness. Thus, only a portion of the available consciousness is experienced in ordinary waking consciousness.

But OWC is just one, although the most familiar, of a number of states of consciousness. Sleep, hypnotic trance, extreme arousal (as in an auto accident),

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<sup>35</sup>Whithead, p. 23. <sup>36</sup>Morgan and King, p. 275.

intoxication and a number of others would be examples of ASC. To gain a better perspective on consciousness as a whole, this chapter has been organized to deal with the variety of states of consciousness.

What follows is a discussion of the means of altering consciousness, the characteristics of altered states of consciousness and finally the special forms of consciousness referred to as peak experiences or cosmic consciousness. The method will be to correlate experience, its characteristics and its descriptions with the physical data established in the preceding chapter.

#### Means of Altering Consciousness.

A number of meditative practices which are used to induce ASC are described by Maupin.<sup>37</sup> Most of these involve particular forms of posture, breathing and attention that are generally designed to produce a state of sensory deprivation. Even the painful Zazen may be seen as sensory deprivation in that a single pain, no matter how intense, if it is not varied will become boring and the threshold for conscious awareness will increase. What is involved is activity which affects the electrochemical balance of the brain. Whether it is the Buddhist Monk at 6-7 Hz or the Hindu Yogin at 4-5 Hz, the basic principle is the same.

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<sup>37</sup>E. Maupin, "Individual Differences in Response to a Zen Meditation Exercise," in Tart, pp. 181-190.

Pahnke put it well when he said, "Thus, the Hindu Yogin practicing breath control or the Christian Monk spending long hours in solitary prayer may be seen to be influencing body chemistry".<sup>38</sup> It is not surprising that alterations in brain chemistry produced by a number of drugs induce a variety of ASC. Some drugs produce psychotic states while others induce trance, sleep or even states similar to mystical states of consciousness.

Ludwig lists five ways to alter consciousness:

(1) a reduction in sensory or motor activity (sensory deprivation), (2) an increase in sensory or motor activity (sensory overload), (3) an increase in alertness, (4) a decrease in alertness and (5) the presence of psychosomatic factors (sleep deprivation, fasting, drugs, etc.).<sup>39</sup> Each of these means may be seen as influencing the electro-chemical activity of the brain.

Sensory deprivation leads to a lowering of the threshold of awareness. Sensory overload leads to an increase in the threshold. Increases and decreases in alertness involve changes in the brainwave frequency. Psychosomatic factors are all chemically related. Sleep deprivation leads to a buildup of awareness mechanism

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<sup>38</sup>Walter N. Pahnke, "Implications of LSD and Experimental Mysticism," in Tart, p. 428.

<sup>39</sup>Arnold M. Ludwig, "Altered States of Consciousness," in Tart, p. 12.

by-products. Fasting alters blood sugar content which in turn, influences brain chemistry. A large number of chemicals affect brain chemistry. Substances as simple as nitrous oxide and as complex as LSD produce profound changes in awareness by affecting brain chemistry.

#### Characteristics of Altered States of Consciousness.

Ludwig lists a number of general characteristics of ASC. The following list is derived from a compilation of observations of persons experiencing ASC and reported objectively.<sup>40</sup> The following general characteristics describe, without value judgment, changes in one who experiences ASC. These characteristics are: (1) alterations in thinking (2) disturbed time sense (3) loss of self control (4) changes in emotional expression (5) changes in body image (6) perceptual distortions (7) changes in meaning or significance (8) sense of the ineffable (9) feelings of rejuvenation (10) hypersuggestibility.

In the following subsections each of these characteristics will be considered.

Alterations in thinking. The alterations in thinking experienced by persons in ASC are the result of at least two factors. The first is that of state-bound knowledge and the second is the alteration of the normal

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<sup>40</sup>Ibid., pp. 15-20.

electrochemical balance of the brain. The state-bound knowledge phenomena leads to what we might think of as split personalities, each with a store of knowledge and particular thought process. Thinking, as well as all other cognitive processes, is associated with electrochemical processes in the brain. Alterations in brain chemistry would then quite reasonably lead to alterations in the thought process.

The unbelievable complexity of the brain and its staggering capacity for association portends a magnitude of possible experience that is astronomical. With the possibility for the multiplication of experience as a result of the brain's associative network structure, the brain case encompasses a very complex, miniaturized and extensive space. "In my father's house are many mansions", was the way Jesus put it.<sup>41</sup> There is room for heaven and hell and a whole lot more. Increases in the magnitude of conscious awareness would naturally lead to alterations in the thought process.

Disturbed time sense. Some familiar instances of this phenomenon are the old saws, "Time flies when you're having a good time", "Time spent in a dentist's chair seems to take forever" and "A watched pot never boils". These subjective experiences of time relativity are waking

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<sup>41</sup>John 14:2 (KJV)

consciousness phenomena. It is in sleep that we find a more dramatic example. According to Dement we experience a series of 90 minute cycles when we sleep, ranging from 6-7 Hz down to near 0 Hz.<sup>42</sup> When the brain activity cycles up to 4-5 Hz, after reaching some point near 0 Hz, a rapid eye movement (REM) period begins. A REM period is that time when the brain is in the dream state. It is so named because of the rapid movement of the eyes observable during this process. A dream with a subjective duration of an hour or more may only take a couple of minutes. Thus, there is about a 20 to 1 ratio of the subjective time scale in this SOC, here presented as an example, to that of OWC.<sup>43</sup>

Associated with this phenomenon is the relativity of time in "flow" experience.<sup>44</sup> Flow is a state of self-forgetful absorption in a task--from chess to sex or football--in which time is subjectively experienced as slowing down. Football players describe becoming so absorbed in the game that they enter a state in which everything is in slow motion.<sup>45</sup> I have heard numerous stories of persons falling out of a window or having an

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<sup>42</sup>William Dement, "Two Kinds of Sleep," in Goleman and Davidson, pp. 74-75.

<sup>43</sup>Conway, p. 284.

<sup>44</sup>Mihalyi Csikszentmihalyi, "The Flow Experience," in Goleman and Davidson, p. 63.

<sup>45</sup>Ibid.

auto accident who saw their whole lives pass before them. Now in my present SOC it would take me some hours to do a decent review of the past week, but the radical SOC entered because of the extreme arousal caused by the threat of imminent death has a time scale that is almost without limit. Persons experienced in a drug induced ASC have reported time compression, such as watching the sweep second hand on a clock come to an apparent stop.<sup>46</sup>

Although the experiences seem to last an eternity, the second hand resumes its movement as soon as cognitive activity is initiated. As the brain cycles down to near 0 Hz the time scale expands geometrically toward infinity. The descriptions of experiences of death, the ultimate ASC, could all happen and a whole eternity pass in the short time it takes for the electrochemical activity of the brain to retreat through the stages of anaesthesia mentioned earlier.

Loss of control. When people talk about loss of control in ASC they are really referring to loss of neocortical or the dominant occasion of experience in OWC control. By the repressive hierarchy of control exercised by various levels of the brain, it is apparent that as one enters ASC, levels other than the neocortex assume dominance. The

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<sup>46</sup>Stanley Krippner, "The Psychedelic State, The Hypnotic Trance, and The Creative Act," in Tart, p. 285ff.



subjective feeling is one of loss of control. Upon entry into some ASC, feelings of dying or dissolving or simply disappearing are reported. Although the body may continue to do things, it is observed by the person as if it were someone else. After some time, the person may become that other person and then notices in retrospect that he is no longer in that ASC, but has been reborn again to this order of reality.<sup>47</sup>

There is a peculiar aspect of the control process that needs to be considered. Is it an effect or a cause of ASC? According to Ludwig, a radical increase or decrease in motor cognitive activity will induce an ASC.<sup>48</sup> The Taoist speaks of the "wu wei" or path of least resistance as the route to higher consciousness.<sup>49</sup> Jesus is said to have spoken about laying down your life and numerous monks and mystics from many traditions tout non-action as a path to divinity. "Be still (in Hebrew--to cause to fall or let go) and know that I am God."<sup>50</sup> The "still point" in Zen meditation or the frozen yogic postures are other examples.

All of this suggests that the neocortical control is both a product and a producer of OWC. The dominant occasion in OWC control is our anchor in the rough seas of

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<sup>47</sup>Ludwig, p. 16. <sup>48</sup>Ibid., p. 12.

<sup>49</sup>John A. Hutchison, Paths of Faith (New York: McGraw-Hill, 1975), pp. 226, 240.

<sup>50</sup>Psalm 46:10 (RSV)

the spectrum of ASC. When an inhibited person is asked to "let down their hair", they are really being asked to lessen neocortical control to induce an ASC in which their personality is more sociable. Howard Cosell is reported to have a couple of vodkas to "mellow" his performance on "Monday Night Football".

Theologically viewed, this is the relation between law and grace on a physical level. Most of the laws, even today are stated in thou-shalt-not form. Grace on the other hand is granted to us. We are the objects of grace. We do not have control of grace. I believe that the need for loss of control to achieve authentic existence could be the root of the existentialists' talk of anxiety. Subjectively, loss of control is dreadful. Death is the ultimate loss of control and ego death, its non-mortal analogue, is no less fearsome. For those who brave the feared process, the glories of ASC and rebirth are the rewards. Hence the loss of the fear of death is mentioned by Dean as the result of the experience of peak consciousness.<sup>51</sup>

Changes in emotional expression. The normal relationship of the dominant occasion in OWC to emotion is one of varying amounts of control. The neocortex is usually

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<sup>51</sup>Stanley R. Dean, "The Ultraconscious Mind," in White, pp. 21-23.

in control of the limbic region and hence a large part of our education as children is the gaining and maintaining of the control of our emotions. Many psychoanalytic and psychotherapeutic techniques involve the adjustment of neocortical control of emotions. Responsive listening, Pearl's "Hot Seat", primal therapy, rage reduction and other techniques are used to elicit and deal with emotions and feelings, their parasympathetic concomitants. Some people exercise too much control, others not enough and most people repress or express emotions inappropriately at least some of the time.

As neocortical control lessens, limbic (or emotional), and to varying degrees, R-complex (or survival level processes), becomes more dominant. The contrast between the levels in dominance leads to a wide contrast in emotional expression. Experiences from agony to ecstasy are reported by those who experience ASC. In Whitehead's metaphysical system, emotion is more primary than form.<sup>52</sup> Physically, emotion comes from a more primitive level of the brain than cognition of form, which would be neocortical.

Changes in body image. The alteration of the electrochemical processes associated with consciousness also results in alterations in the way we perceive our

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<sup>52</sup>Whitehead, p. 23.

bodies. The proprioceptive stimuli entering consciousness are affected by the novel neurological homeostasis of ASC, which in turn effects the subjective experience of the body. Ludwig reports that in some ASC persons experience ". . . a dissolution of boundaries between self and others, the world or the universe".<sup>53</sup> When we consider the data from Chapter II this phenomenon is easily explicable. The body image we presently perceive is a construct of consciousness as is the rest of the universe. As the brain's electro-chemical balance is disturbed by drugs, meditation or any other means, the construct begins to break down and the underlying processes become apparent. Like an earthquake at Disneyland, as the "props" begin to fall down, the "behind-the-scenes" mechanisms are exposed.

The brain case circumscribes the environment of our construct of the universe. All that is encased is a unity, because our body image and all the other images in our consciousness are produced by the brain. There is no reason why the "seat" of consciousness, or the self, may not be anywhere in the environment. That is, focus of the dominant occasion could just as well be here on this paper looking up at the reader's face. Thus, mystics report experiences of becoming "one with the universe". In reality they are one with their construct of the universe.

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<sup>53</sup>Ludwig, p. 16.

By this, I do not mean that there is not a sense in which we are one with the "real" universe. According to Whitehead's metaphysics, we are linked by physical prehensions to every entity in the universe.<sup>54</sup> It is just that the unity perceived by the mystics is not this unity, but the unity of the organism that engenders or is associated with our consciousness.

The above facts also account for another heretofore unexplained phenomenon. "Out-of-the-body" travel is reported by mystics and psychics alike. Bhaktivedanta Swami Prabhupada has written a book entitled, "Easy Journeys to Other Planets" in which he describes extra-terrestrial travel as the outgrowth of mystical union with Krishna Consciousness--a yogic state somewhere between 6 and 2 Hz. The assurance with which he writes encourages belief that he has experienced this psychic travel. It is not difficult to see that my model provides room for one to have such experiences by simply shifting the seat or focus of consciousness to the desired construct and with the speed of thought you are anywhere in the universe you choose to be.<sup>55</sup> Of course, to an outside observer you will not have left your chair. But this is not to reduce "out-of-the-body" travel to pure hallucination. As

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<sup>54</sup>Whitehead, p. 27.

<sup>55</sup>Bhaktivedanta Prabhupada, Easy Journeys to Other Planets (New York: Bhaktivedanta Book Trust, 1969)

proposed by Process Thought, our bodies are in prehensive contact with every atom in the universe. It is not unlikely then that the image construct produced by the brain could be a surprisingly accurate representation of reality. Although the strength of a prehension is in an inverse relation to the square of the distance between the entities prehended and prehending, there exists no reason why my construct of the population of another star system should not be as accurate as my construct of the page before me. The experience of Edgar Cayce and other psychics tends to confirm the accuracy of constructs of places both physically and temporally.<sup>56</sup>

Perceptual distortions. For reasons similar to those for the alteration of body image in ASC, the rest of the perceived construct of the universe in the brain is subject to distortion in altered states. Just as in the dream state, the brain may produce its own images, modeled on, but not limited to, objects experienced in the universe and in ASC may combine elements of the ordinary construct with its own images. Consider the following two processes. First, with your eyes open, visualize an apple before you. Simultaneously, remember the multiplications of consciousness produced by alterations in the brain's biochemical

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<sup>56</sup>Jeremy Kingston, Healing Without Medicine (Danbury, CT; Danbury Press, 1975), pp. 78-95.

balance mentioned in Chapter II. If you can imagine both processes happening at the same time, you have a good idea of how a hallucination is produced. Because of the complexity of the brain earlier alluded to, the complexity of "hallucinations", multiverse constructs without referents in the physical universe, is almost without limit.

The aspect of hallucinations I find most facinating is the similarity between beings hallucinated and the gods and demons of primitive cosmologies. The work of Dr. Van Dusen referred to in the first chapter is but one of a number of descriptions of multiverse "beings". Dr. Van Dusen's model will serve to illustrate this similarity to primitive cosmologies. He reports that hallucinated beings--whether visual or auditory--may be divided into two groups or orders.<sup>57</sup> The "lower order" beings are characterized as like demons or drunken bums who suggest vile acts, taunt, tease, threaten, berate and insult their "victims".<sup>58</sup> They have a revulsion for religion though many claim to be Jesus Christ. The "higher order" hallucinations are more rare, constituting less than a fifth of hallucinated beings. These are characterized by loving concern, respect for freedom, symbolic, religious, supportive and genuinely instructive.<sup>59</sup> These beings rarely talk, but when they do, they can, unlike those of

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<sup>57</sup>Van Dusen, p. 70. <sup>58</sup>Ibid., p. 71. <sup>59</sup>Ibid., p. 73.

the lower order, converse on a higher intellectual plane than the person who hallucinates them.<sup>60</sup>

Broadly speaking these hallucinated beings appear to be divided into a divine or angelic group and a demonic group. I perceive many of the traits of the lower order as animalistic. The aggressive, grasping, murderous qualities displayed are not unlike those attributed to the R-complex. Conversely, the kinds of actions and qualities displayed by the higher order are definitely neocortical.

Now, if it is supposed that the R-complex/neocortical levels of the brain are associated with lower and higher order beings respectively, then the Divine Comedy has found a physical referent. It then follows that all influence for good, inspiration, reason, logic, The Word, must be seen as coming from above--the neocortex relative to our body image. All negative influence, greed, aggression, etc., must be seen as coming from below--the R-complex relative to our body image. Heaven is above us and hell below.

Changes in meaning. Were everyone who experiences an altered state of consciousness to shrug it off as a bad dream, we could dismiss the three-stage universe as mere hallucination. However, persons in altered states<sup>61</sup>

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<sup>60</sup>Ibid., p. 74.

<sup>61</sup>Ludwig, p. 17.



generally attach increased significance to their experience. Some altered states give the feeling of having just awakened and is used in several religious traditions, usually being referred to as enlightenment or awakening. The feeling is one that seems to make the state experienced the only truly relevant state and all other states seem like dreams. One usually says after awakening from a bad dream, "Whew, it was only a dream". In the same way, some altered states make ordinary reality seem no more than a dream. I think that there are several dynamics that shed light on this phenomenon.

In the earlier discussion of state-bound knowledge, the sense of the significance is relevant only for the level on which it is experienced. What is significant in a dream may not be so in waking reality, and vice versa. We have all had the experience of finding someone on our "wavelength", called 'simpatico'. They seem to have almost telepathically augmented understanding of "where we are coming from". Drunks seem to understand each other better than someone who is not in the same state of intoxication. I think that there is a distinct possibility that they are on the same wavelength. Persons whose brains are functioning at the same cycles per second, with the same levels of the brain in dominance, may be said to be in the same state of consciousness and therefore share a similar sense of the significant.

This effect has been responsible for a revolution in values in the past two decades. It is my belief that the use of drugs was responsible for the alteration in the values of persons who used them. The drugs induced ASC, in which the usual material values were no longer significant. The non-material values of the drug culture appeared foolish to persons in ordinary consciousness and were, I believe, at least partly responsible for the generation gap phenomenon that so affected the course of family life in the late sixties and early seventies.

While I am in favor of the non-material values, I do not unreservedly advocate the acceptance of the values of altered states of consciousness. A friend of mine was so taken with the revelations when he was on LSD that he decided to write one of them down because state-bound knowledge phenomenon prevented him from remembering his revelations when he was not under the influence. The morning after a particularly meaningful experience, he rushed downstairs only to find that he had written, "The room smells funny". This no longer was revelatory and I cannot imagine what this statement meant to him in ASC. I cite this example to make the point that only some revelations of ASC may be trusted. The revelations of "psychotic insight",<sup>62</sup> delirious states, extreme

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<sup>62</sup>Ibid.

intoxification and nightmares are examples of states generally distrusted, at least for their revelational content. The difficulty is that some states, such as those experienced by mystics, reveal the unity of existence, the brotherhood of man, the primacy of love, etc. Should we distrust these revelations just because they were revealed in altered states of consciousness? Jesus suggested that we test a spirit by its fruits, which may be applicable here, where there is a lack of more objective grounds for analysis.

The theological relevance of the ASC phenomenon presents a problem to the Church and any other organization that would lift up values based upon these revelations. The unity of existence, the brotherhood of man, the love of God for us and especially the existence of angels and demons are all suspect because they are attributable to the effects of ASC. Some of these assertions can be substantiated by physics or biology, but others are left with only our faith on the quality of the revelational state from which it was gained.

Ineffability. Mystics through the ages, who experienced altered states, have claimed to be unable to describe their perceptions or to give a clear picture of the subjective effects of these states. The loss of significance resulting from the change in SOC is only a part of this phenomenon. As Ludwig states, ". . . contributing

to the sense of the ineffable is the tendency of persons to develop varying degrees of amnesias for their experiences during profound alterations of consciousness, such as the hypnotic trance, somnambulistic trance, possession fits, dreaming, mystical experiences, delirious states, drug intoxications, auras, orgiastic and ecstatic states and the like".<sup>63</sup> I believe that the state-bound knowledge phenomenon is at least partially responsible for this loss of memory. But, there are at least two other phenomena that contribute to this ineffability. Synesthesia, or the blending of senses, results in the experiences of tasting color, seeing sound, etc., and contributes to the unique quality of ASC.<sup>64</sup> Synesthesia is lifted up as an example of the uniqueness of experience in ASC, but other equally unfamiliar phenomena occur. The result is that much of the content of ASC is of such a nature that it is not in familiar categories of form, substance, duration, etc. The second phenomenon contributing to the ineffability of these experiences is the change in significance relevant to the level or state in which it was experienced, and none other.

There is one more factor to be considered. Consciousness is said to expand during some ASC and the physiology of the alteration process is really an

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<sup>63</sup>Ibid., p. 18. <sup>64</sup>Ibid., p. 17.

expansion, because of the increase of the number of cells involved in the construction of consciousness. As the reticular formation breaks down, more of the naturally occurring stimuli are admitted to consciousness. Thus, the thoughts and images of ASC have the capacity of being on a whole, much larger or more complex, or more intense than their counterparts of ordinary consciousness. In other words, the experiences of ASC are too big for usual language. I think that much of art and music is an attempt to express thoughts too large for any other medium.

Feelings of rejuvenation. Associated with many ASC is the feeling of increased strength and vigor. There are at least two physical reasons for this phenomenon. The first is that some chemical changes in the brain increase the speed of neural transmission.<sup>65</sup> As neural transmission time decreases, the multiverse appears to slow down. This is similar to the flow experience. Persons in psychotic states are known to possess great strength. The physiological changes associated with some ASC, such as increased adrenaline production and heart rate, contribute to this phenomenon. There is the classic example of a mother lifting a car off of her child. Considering the small portion of our potential that we use, it is quite

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<sup>65</sup>Solomon Snyder, "The True Speed Trip: Schizophrenia," in White, p. 105ff.

understandable that persons experiencing ASC feel greater strength and vigor.

Alteration of the threshold downward would cause an increase in the intensity of our perceived body image, because of the resultant increase in the number of stimuli admitted to conscious awareness. The best example of this is to be found in Kundalini Yoga. Like LSD, certain exercised and mental disciplines cause a radical lowering of the threshold to awareness of the lumbar ganglion.<sup>66</sup> This has been described by practitioners of Kundalini Yoga as a tremendous rush of electrical energy ascending the spinal column from its base and discharging in a burst into the brain.<sup>67</sup> The disturbance of the brain's electrochemical balance and the resultant effect on the threshold process is thus responsible for feelings of greater intensity and would account for a feeling of rejuvenation.

The use of peyote (*lophophora Williamsii*) by the Native American Church to increase health and vigor is a good example of both the above described phenomena.<sup>68</sup> Mescaline, the psychoactive ingredient, is an alkaloid of the amphetamine family, the spectrum of drugs described by

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<sup>66</sup>William A. Tiller, "Energy Fields and the Human Body," in White, p. 276.

<sup>67</sup>Pahnke, p. 423.

<sup>68</sup>J. S. Slotkin, "The Peyote Way," in William A. Lessa and Evon Z. Vogt (eds.) Reader in Comparative Religion (ed. 3d; New York: Harper & Row, 1972), p. 522.

Snyder as affecting neural transmission speed.<sup>69</sup> The mescaline molecule also contains the indanole ring present in psilocybin and LSD.<sup>70</sup> The feeling of vigor experienced from the amphetamine structure and the threshold lowering caused by the indanole structure would together be seen as producing the subjective experience of health and vigor.

Hypersuggestibility. I will use this term, as does Ludwig,<sup>71</sup> to connote:

. . . not only the numerous instances of "primary" and "secondary" suggestibility but also the increased susceptibility and propensity of persons uncritically to accept and/or automatically to respond to specific statements (i.e., commands or instructions of a leader, shaman, demagogue, or hypnotist) or non-specific cues (i.e., cultural or group expectations for certain types of behavior or subjective feelings).

The most familiar manifestation of this phenomenon is that of the hypnotized person's susceptibility to suggestion. Although Ludwig sees this phenomenon as primarily a result of the need to bolster the faculty of reality testing,<sup>72</sup> a neocortical function, I think that several other factors are involved in this propensity to suggestion experienced by persons in ASC. To begin with, the loss of control experienced in some ASC increases

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<sup>69</sup>Snyder, p. 105ff.

<sup>70</sup>S. Cohen, The Beyond Within: The LSD Story (New York: Atheneum Press, 1964, p. 179

<sup>71</sup>Ludwig, p. 19.      <sup>72</sup>Ibid.

existential anxiety. An ASC can be a frightening new world to an untrained person who like the "foxhole Christian", may seek the support of anyone and anything, the more authoritarian the better. This anxiety is directly proportional to the "distance" of the ASC from OWC and inversely proportional to the familiarity of the ASC.

As one moves into ASC that are "distant", the state-bound knowledge phenomenon adds to the experienced anxiety by removing the support provided by our OWC knowledge. This is one of the most disconcerting aspects of ASC. Both history and anthropology confirm the universal need for a "story" or a "myth" that constitutes our experience. I say constitutes, rather than explains, because we only experience what our "myth" can accommodate. Thus, radical shifts in SOC which lead to a loss of our "story" cause one to adopt a new "story". Is it any wonder that most of the commands or suggestions given by hypnotists are in narrative form? "You are getting sleepy", is among the stock introductory phrases used and illustrates this "story" quality. Prayers, chants and even sermons can be seen to act as suggestions to persons in ASC connected with the practice of certain religious rituals, revivals, dervishes, etc.

In ASC in which awareness is expanded by an increase in threshold or a similar phenomenon, there is a resultant increase in the number of possible associations,



whether or not they are appropriate. With an increase in associations, there is an increase in significance. This results because associations are the heart of significance. One thing is a "sign" for another. For example, the odor of a tiger is significant to an animal because it is associated with a tiger. What we call significance is nothing other than associations. Therefore, in an ASC in which there is increased significance, there is also an increase in the importance of suggestions. At the same time, the increase in the number of cells contributing to awareness increases the ability to imagine and hallucinate. Thus, one may create an alternative reality in any suggested mode.<sup>73</sup>

#### Special States.

Dean reports on the particular type of ASC that is generally referred to as peak or cosmic consciousness experiences. These experiences have the following characteristics: (1) intense light (2) ecstasy (3) ineffable intellectual illumination (4) feeling of transcendental love (5) fear of death ceases, physical and mental pain are reduced or absent (6) reordering of priorities away from material values (7) mental and physical quickening and increased vigor (8) sense of mission (9) charismatic

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<sup>73</sup>Ibid.

personality change.<sup>74</sup>

A similar set of categories were developed by Pahnke from a historical survey of the literature of spontaneous mysticism but is used to show the similarity between spontaneous and drug induced ASC. These categories are meant to be general and inclusive so that any description of a mystical experience could be subsumed. These categories are: (1) unity (2) objectivity (intuitive illumination) and reality (sense of the authority of the experience) (3) transcendence of space and time (4) sense of sacredness (5) deeply felt positive mood (6) paradoxicalness (7) alleged ineffability (8) transiency (9) positive changes in behavior and/or attitude.<sup>75</sup>

Although there is some degree of similarity between peak experiences, I believe that there are a variety of types. Whereas Dean subsumes satori, samadhi, unio mystica, shema and kairos as "ultraconsciousness",<sup>76</sup> I think that there is evidence that each of these states of consciousness is a unique blend of levels of control and brainwave pattern. EEG studies by Anand, et al., of yogis and Kamiya's EEG study of Zen masters suggest that mahanand samadhi and satori are very different states.<sup>77</sup> I believe that each religion's tradition develops a taste,

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<sup>74</sup>Dean, pp. 21-23. <sup>75</sup>Pahnke, pp. 411-417.

<sup>76</sup>Dean, pp. 15-16. <sup>77</sup>Tart, pp. 516-529.

as it were, for a particular SOC or variety of SOC. Considering that there are  $2^{10^{13}}$  possible brain states, there is certainly a lot of choice.

The broad similarity between spontaneous, trained and drug induced peak experiences is understandable in terms of the alteration in the brain's functional characteristics through achievement of a particular neuroelectrochemical homeostasis. I believe it is in these states of consciousness that the full character of the organism underlying our image construct begins to become apparent. Our unity with existence is our unity with the brain. I believe that there are physiological correlates for the characteristics of peak experiences in the same manner that there were physiological correlates for the characteristics of ASC.

### Discussion.

From an overview of ASC it is apparent that with the aid of the physical model, the descriptions of existence of both the physical sciences and the subjective disciplines coincide. It is possible to accept both the validity of the scientific assertions about existence and the variety of subjective descriptions without contradiction.

However, acceptance of the common sense model of experience has resulted in the profusion and confusion of

religions, cosmologies, philosophies, etc. For all practical purposes, we could forget that multiverse and universe are not the same thing. Although ten identical objects in the universe are all of the same size, they vary with the inverse square of the distance in the multiverse. We are so used to this phenomenon that it is never or rarely noticed. However, problems of meaning develop when we experience certain changes in brain chemistry. Fasting, sensory deprivation, drugs and some other methods can cause alterations in the functioning of the brain to produce ASC. In these ASC the nature of the universe, our body image, etc., are likely to change. The resultant visions or experiences do not fit in with our perception of the universe and numerous cosmologies and religions have arisen to fill the gap. To one who experiences these visions, the feeling that one has seen God or some spirit or demon or even a different order of reality is inescapable. By the mathematics of it, although accuracy would be impossible, the magnitude of the quality and contents that are possible for the brain to produce are staggering. Can you imagine your entire existence, its depth and intensity, experienced by each cell in your body? Then this unimaginable huge universe condensed into an atom and another universe constructed on this scale and so on thousands of times? The potential is without end if one considers that each cell in the body contains an image of

the whole in its chromosomes.

Which of these two universes are primary? The answer to this question must be phrased carefully, because the groundwork just laid is almost solipsism. Actually, when I first discovered the model described, I was given the existential question "Am I alone?" If I can never escape being inside of a head, am I not technically alone? Is there anyone out there on the outside of the multiverse? Faith is quick with the positive reply, but there are some very suspicious facts about the multiverse and the universe that need to be considered.

Have you ever noticed that the brain is rather tree-like in its construction? As the brain's own shape, the tree-like structure would be the easiest to produce for extremely complex processes. For example, if you drop colored dye into still water, it will spread in a manner commensurate with the currents in the water. The overall shape looks like the brain. Similarly, clouds in the sky or the smoke from a tip of a lit cigarette produce the same basic shape. If I were a solipsist, these would look suspiciously like poorly disguised hoaxes. A lazy brain produces the simplest pattern, its own shape, for the complex objects around it. Or is it that the same forces involved in the patterning of water are at work creating the pattern for the brain? That is, is the brain like water or water like the brain? I choose the former as an

act of faith but can show no proof that the latter is not the case.

Where does that leave us? We are each face-to-face with something that is like us but billions of times more complex. If you would treat one, yourself, as a person, how should you treat something (or someone) a billion times more complex?

One could call this other God, but I see it as an image of God. From this perspective, everyone is the same as me, the same brain stuff. So, should I love my neighbor as myself? Of course, because he is myself. Was the Apostle Paul's image of the Church as parts of a single body analogical or literal? Are we in reality parts of a single body? Yes! According to the proposed model, the multiverse constitutes a plurality of persons that are technically contained within a single body.

That we are in a body does not necessarily lead to a proof of the faith. The facts could be interpreted in a number of ways. Mystics speak in glowing terms of the unity of existence, our oneness with it all and some philosophers, like Whitehead, support this idea philosophically.<sup>78</sup> It appears all of these experiences arise from experiences of ASC reported by mystics in which the perceived unity of all was the unity of the multiverse in our heads.

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<sup>78</sup>Whitehead, p. 27.

## CHAPTER IV

## SUMMARY AND CONCLUSION

Summary.

This project is the construction of a model for the facilitation of dialogue between the subjective and objective disciplines as they relate to human experience.

The method employed is the correlation of data from the physical sciences, particularly brain physiology, with descriptions of altered states of consciousness. The data from physical sciences include a brief survey of the ontogeny of the universe, evolution and the ontogeny, structure and function of the human brain. The sections dealing with the brain include brain levels, brain states, brain hemispheres and relevant brain structures and functions. The data on altered states of consciousness includes a description of the means of their induction, characteristics and special states. Each of these are related to the data from the sections on the physical sciences.

The proposed model is the combination of the physical data and the subjective data. This model is contrasted with the common sense model of experience to demonstrate the basic points of divergence. Whereas, common sense tells us that the image of the objects we see are before us, physiology suggests that the visual field

is in the occipital cortex. Recognition of this fact renders harmonious the multiplicity of subjective descriptions of existence and the relevant facts of science.

### Conclusion.

The conclusions of this project vary for the discipline considered. The following are key conclusions and implications, as well as some aspects requiring further investigation.

Physical sciences. The most important conclusion of this project for the physical sciences is that the world as described by the physical sciences is on the outside of our world of experience, the "multiverse". Although this makes the world of matter, the universe, a society of entities far removed from our experience, it does not change any of the basic laws or premises of the sciences.

To better understand the relationship of consciousness or awareness to the brain, it would be helpful to know: (1) If in altered states of consciousness, we are aware of and/or use different parts of the brain than we do in ordinary waking consciousness. That is, if a pathway is cut, as in the extreme right representation in Plate V, we lose a portion of the visual field in ordinary waking consciousness. But would that portion of the visual field be experientiable in an altered state of consciousness? (2) The location of heaven and hell. Kiefer has suggested



that heaven or the Kingdom of God is in the Diencephalon.<sup>79</sup> I have suggested the neocortex as a likely candidate. In other words, where are the physical correlates in the brain that correspond to some of the experiences of altered states of consciousness? Or, are places like heaven and hell states of consciousness and not associated with any specific structure, but more associated with states of the system? (3) If the contrast exemplified by subatomics, atomics, etc., related to the mental/physical contrast of the two hemispheres of the brain?

Philosophy. This model confirms some of the assertions of solipsists and personal idealists while relativizing those assertions. Each individual is, or appears to be, the only being in the world and creates a personal reality. But, the means by which personal reality comes about affirms the existence of others in the universe, though not necessarily in our personal multiverses. We create our own reality (multiverse), but this is really re-creation of a universe that has an existence apart from any one of us.

This model raises some questions for Process Thought. (1) Because every object in our ordinary waking consciousness multiverse is a mental construct of a physical

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<sup>79</sup>Durand Kiefer, "Intermeditation Notes: Reports From Inner Space," in White, p. 181.

object, the mental/physical pole concept is a description of an object in two worlds. Before you is a mental construct of a physical page. But, are "mental" and "physical" descriptive of the object or the process?

(2) Or, to make matters more complex, are there mental and physical poles of both the mental construct and the physical correlates?

Theology. The major conclusions for theology are a result of the correlation between brain physiology and the quality and content of altered state of consciousness. Much of what has been said about God, heaven, hell, angels and demons may be attributed to physiological structure or function.

Some questions raised are: (1) Is God only an experience of our own physiology? (2) Should we believe the claims of mystics and other veterans of altered states of consciousness? (3) Most fundamentally, what status and function are we to ascribe to theology as a discipline? In light of Chapter III, much of the structure and content of our myth, symbols, rituals and religious scriptures (sutras, traditions, etc.) seem to be descriptions of subjective experiences of the structure, content and significance of the topography of existence from the perspective of altered states of consciousness and the means of achieving and maintaining these states of consciousness. If we were to view Jesus as a person in an

altered state of consciousness termed "The Presence of the Holy Spirit" and his teachings as instructions in the achievement, maintenance and subjective experience of this altered state of consciousness, what becomes of theology? Are the Pentecostal Churches which stress the importance of the experience of the Baptism of the Holy Spirit, rather than understanding or social action, more to the point than the majority of United Methodists whose priorities are reversed?

The emphasis of Zen or yogic training is obviously the achievement of an altered state of consciousness. Much of the New Testament could be seen as emphasizing a change of heart or mind that results from, and in an altered state of consciousness. Charles Tart has gone so far as to suggest that, "On the basis of research findings . . . these phenomena are now sufficiently reproducible to allow mysticism to be studied scientifically".<sup>80</sup> Is theology allegorical physiology?

The quest for an inclusive vision, a way of looking at the human phenomenon which accounts, or at least makes room, for all of the facts of experience must take account of both the universe and the multiverse. The tendency of the world toward increased complexity and contrast is reflected in the complexity and mental/physical nature of

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<sup>80</sup>Pahnke, p. 427.

our experience. With two minds, situated in two worlds, we are in a peculiar position. Scientists say that the universe is all there is and mystics say that the multiverse is more than just the universe. Through the model constructed in the foregoing, both can be seen as correct as far as they go, but each is in need of the contributions of the other. Objective and subjective disciplines have here a model for dialogue that I pray may be of use to both.

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